EPA910/R-98-006

United States Environmental Protection Agency

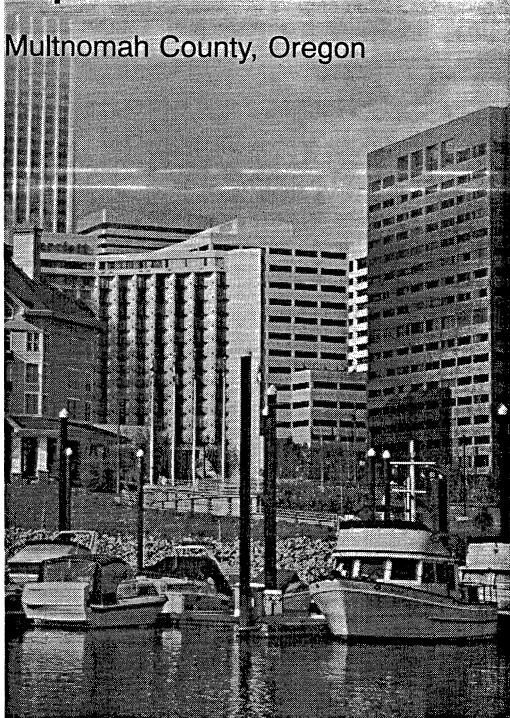
Office of Environmental Cleanup

Region 10 1200 Sixth Avenue Seattle WA 98101 Alaska Idaho Oregon Washington

May 1998



Portland Harbor Sediment Investigation Report





Contract No. 68-W9-0046 Work Assignment No. 46-23-0JZZ Work Order No. 04000-019-036-4100 Document Control No. 04000-019-036-AACE





# PORTLAND HARBOR SEDIMENT INVESTIGATION REPORT MULTNOMAH COUNTY, OREGON

Prepared for
U.S. Environmental Protection Agency\_
Region X

1200 Sixth Avenue
Seattle, Washington 98101

Contract No. 68-W9-0046
Work Assignment No. 46-23-0JZZ
Work Order No. 04000-019-036-4100
Document Control No. 04000-019-036-AACE

May 1998

Prepared by
Roy F. Weston, Inc.
700 Fifth Avenue
Suite 5700
Seattle, WA 98104-5057

# ARCS QUALITY ASSURANCE CONCURRENCE

Portland Harbor Sediment Investigation

		Multnomah County,	Oregon
Contract Number:		68-W9 <b>-</b> 0046	
Work Assignment Number:		46-23-0JZZ .	
Responsible Organization:		Roy F. Weston, Inc. 700 Fifth Avenue, Suite 5700 Seattle, Washington 98104	
Concurrences			
Name:	Karen M. Stash		,
Title:	Project Manager, Roy F. W	eston, Inc.	
Signature:	-1/157	<u></u>	Date 5 5 78
Name:	Steve R. Fuller, RG		
Title:	Manager, Roy F. Weston, I	nc.	
Signature:	& Duller		Date: <u>5/21/9</u> 8
Name:	Frank C. Monahan, PE		
Title:	ARCS Program Manager, I	Roy F. Weston, Inc.	_
Signature:	Estella		Date <u>5/21/9</u> 8

Project Name:

Initial (

## TABLE OF CONTENTS

Section	Page
1. INTRODUCTION	1-1
2. BACKGROUND	
2.1 SITE LOCATION AND DESCRIPTION	
2.2 INDUSTRIAL OPERATIONS IN THE PROJECT AREA	
2.3 INVESTIGATIVE AND REGULATORY HISTORY	2-1
2.4 REGIONAL GEOLOGY	2-2
2.5 AQUATIC RESOURCES AND CRITICAL HABITATS	2-4
2.6 POTENTIAL CONTAMINANT TRANSPORT PATHWAYS AND REC	EPTORS2-5
2.6.1 Sediment	2-5
2.6.2 Surface Water	2-5
2.6.3 Soil	2-6
2.6.5 Air	
3. PROJECT DESCRIPTION	
3.1 SAMPLING OBJECTIVES	
3.2 SAMPLE TYPES, NUMBERS, LOCATIONS, AND RATIONALE	3-1
3.3 SAMPLING METHODS, ANALYTICAL REQUIREMENTS, AND STA	
LOCATIONS	
3.3.1 Sampling Methods	
3.3.2 Analytical Requirements	
3.3.3 Station Locations	
3.4 SAMPLE HANDLING, PACKAGING, AND SHIPPING	
3.5 DOCUMENTATION	3-4
3.6 EQUIPMENT DECONTAMINATION AND INVESTIGATION-DERIV	'ED WASTE3-4
4. SAMPLING RESULTS	4-1
4.1 DATA PRESENTATION	4-1
4.2 DATA EVALUATION	4-1
4.2.1 Effects-Based Screening Values/Guidelines	4-1
4.3 ANALYTICAL RESULTS	4-2
4.3.1 Surface Sediment	
4.3.2 Subsurface Sediment	4-4
4.3.3 Sediment Porewater Analysis	4-6
5 REFERENCES	5-1

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.

# TABLE OF CONTENTS (Continued)

# Section

<u>Page</u>

#### APPENDIX A-FIELD SAMPLE RECORD FORMS

A.1—SURFACE SEDIMENT FIELD SAMPLE RECORD FORMS

A.2—SUBSURFACE SEDIMENT COLLECTION FORMS

A.3—SUBSURFACE SEDIMENT PROCESSING FORMS

A.4—LATITUDE/LONGITUDE DATA

#### APPENDIX B—CONTACT LOG

APPENDIX C-CHAIN OF CUSTODY FORMS AND DATA VALIDATION

REPORTS(Available Upon Request)

# APPENDIX D-ANALYTICAL RESULTS

D.1—SURFACE SEDIMENT DATA

D.2—SUBSURFACE SEDIMENT DATA

**D.3—POREWATER DATA** 

APPENDIX E—SCREENING GUIDELINES

## LIST OF FIGURES

<u>Figure</u>	Title
1-1	Study Area
3-1	Surface and Subsurface Sediment Sampling Locations Between RM 3.5 and RM 5.0
3-2	Surface and Subsurface Sediment Sampling Locations Between RM 5.0 and RM 6.0
3-3	Surface and Subsurface Sediment Sampling Locations Between RM 6.0 and RM 7.0
3-4	Surface and Subsurface Sediment Sampling Locations Between RM 7.0 and RM 8.0
3-5	Surface and Subsurface Sediment Sampling Locations Between RM 8.0 and RM 9.5
4-1	Arsenic Concentrations per River Mile
4-2	Cadmium Concentrations per River Mile
4-3	Chromium Concentrations per River Mile
4-4	Copper Concentrations per River Mile
4-5	Lead Concentrations per River Mile
4-6	Mercury Concentrations per River Mile
4-7	Zinc Concentrations per River Mile
4-8	Total HPAH Concentrations per River Mile
4-9	Total LPAH Concentrations per River Mile
4-10	DDT Concentrations per River Mile
4-11	Total PCB Concentrations per River Mile
4-12	Sediment TBT Concentrations per River Mile
4-13	2,4-D Concentrations per River Mile
4-14	TBT Porewater Concentrations per River Mile

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.

# LIST OF TABLES

<u>Table</u>	<u>Title</u>
3-1	Surface Sediment Sampling Locations and Analysis
3-2	Split Sampling Locations
3-3	Sediment Cores
3-4	Sediment Cores—List of Analytes
3-5 .	Subsurface Sediment Stations—Position Modification

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.